

Project: Great Wolf Lodge, Chesterton
Prepared by: Kathryn Lewis/ David Lewis
Approved by: Phil Bell
Date: 27/02/2020

1.0 Introduction

- 1.1 Motion has been instructed by Great Wolf Resorts (the parent company of Great Wolf Lodge) to advise on highways and transport matters associated with development proposals for a new family resort at a site in Chesterton near Bicester.
- 1.2 A planning application was submitted to Cherwell District Council (CDC) in November 2019 (Planning Ref: 19/02550/F) for:

"Redevelopment of part of golf course to provide new leisure resort (sui generis) incorporating waterpark, family entertainment centre, hotel, conferencing facilities and restaurants with associated access, parking and landscaping."
- 1.3 Motion has been involved in ongoing liaison with Oxfordshire County Council (OCC) following submission of the above planning application.
- 1.4 Following submission of the planning application comments have been provided by Oxfordshire County Council (OCC) in a letter dated 10th January 2020. A subsequent Technical Note was prepared by Motion dated 19th February 2020 which sought to address comments raised by OCC. Following submission of the Technical Note a further response from OCC was received on 24th February 2020.
- 1.5 This Technical Note has been prepared in response to the comments from OCC and provides further detail public transport contributions, cycle network contributions, vehicle routeing and the effect of the development proposals on the signalised crossroads junction in Middleton Stoney.
- 1.6 It is noted that the only objection from OCC with regard the development proposals relates to the impact of the development traffic on the B430/B4030 crossroads in Middleton Stoney.

2.0 Public Transport

- 2.1 The response from OCC dated 10th January requests a contribution of £1.6 million to fund a new public bus service linking the site to Bicester town centre and railway stations for a period of 10 years, based on a cost for the service of £160,000 per year.
- 2.2 Motion maintain the position that a shuttle bus service is the most appropriate approach to promoting access to the development by public transport and has considerable benefits over the provision of a public bus service. As such, the applicant has confirmed that they will continue to provide a shuttle bus service associated with the proposed development.
- 2.3 However, in the interests of reaching a timely resolution to this matter and those relating to the impact of the B430/B4030 junction in Middleton Stoney, the applicant is satisfied to accept the requested £1.6 million contribution towards a new public bus service, as requested by OCC, subject to confirmation of payment schedule for the contribution to be agreed during S106 negotiations.

3.0 Local Cycle Network

The applicant is committed to cycle improvements in the local area and have been liaising with OCC about the potential for providing a reasonable contribution towards local cycle improvements. In their response dated 25th February, OCC have requested a contribution of £70,000 towards improvements to the cycle network between the application site and Bicester. The applicant is satisfied to accept this contribution.

4.0 Vehicle Routeing

- 4.1 It is noted that the single OCC objection to the planning application relates to the effect of the development proposals on the B430/B4030 crossroad in Middleton Stoney. As set out in the Transport Assessment submitted with the planning application in November 2019, it is considered that the impact of the development traffic at the junction is not significant.
- 4.2 Based on the analysis and routeing of vehicle presented in the submitted Transport Assessment the proposed development would result in an increase of 34 vehicle trips at this junction during the morning peak hour and 46 vehicles during the evening peak hour. This is equivalent to less than one additional vehicle movement per minute during the morning and evening peak hours. The change in traffic flow at the B430/B4030 junction as a result of the Proposed Development is imperceptible at just 1.6% in the morning peak hour and 2.5% in the evening peak hour.
- 4.3 The applicant has agreed to provide a contribution towards a coordinated signage strategy for the development with the level of the contribution to be determined subject to further details of the strategy (to be secured as part of a section 106 agreement). If OCC is concerned regarding the operation of the B430/B4030 crossroad in Middleton Stoney then the signage strategy can be developed in a manner that seeks to direct drivers away from the B430 corridor and utilise other routes to access the site. In this regard it is noteworthy that OCC has full control over the signage strategy associated with the proposed development.
- 4.4 The analysis presented in the Transport Assessment assumed that all vehicles approach the site from the M40 (north) and A43 would route via the B430 to access the site. Consideration has been given to potential alternative routes for vehicles between the application site and the M40 (north) and A43. One potential signage strategy would be to direct drivers approaching from the A43, along the B4100 southbound towards Bicester and then along the A4095 towards the site. This is currently the signed route to Bicester from the A43 and does not result in a material change in journey time between the A43 and the site in comparison with the B430 route. The routeing considered in the Transport Assessment and the potential alternative route are presented at [Figure 3.1](#).
- 4.5 Utilising this alternative signage strategy could result in 16 fewer two-way vehicle trips routeing through the B430/B4030 junction during the morning peak hour, 21 fewer two-way vehicle trips during the evening peak. Table 4.1 summarises the change in vehicle trips should vehicles route via the B4100.

	Traffic Movements at Middleton Stoney Signals		
	TA Flows	Adjusted Flows	Change in Flows
AM Peak	34	18	-16
PM Peak	46	25	-21

Table 4.1 Change in Vehicle Trips at Middleton Stoney

- 4.6 The analysis shows that this signage strategy could reduce vehicle movements on the B430 to 18 vehicles in the morning peak hour and 25 vehicles in the evening peak hour, equivalent to one vehicle every 3-4minutes and one vehicle every 2-3 minutes respectively. It is evident that the signage strategy could be developed in a manner to seek to minimise the number of trips associated with the development using the B430 and that this could be achieved via the strategic signage strategy for which the applicant has committed to provide a S106 contribution.

5.0 Junction Capacity - Middleton Stoney

- 5.1 As outlined above, it is considered that the Great Wolf development would not have a material effect on the operation of the junction in comparison with currently consented and other submitted and / or consented planning applications.
- 5.2 However, consideration has been given to highway works at the junction to seek to mitigate the effect of the proposed development.

- 5.3 Table 5.1 shows the operation of the B430/B4030 signalised crossroads in the 2026 baseline BTM plus committed developments scenario, including the Heyford Park Phase 1 development. The assessment includes consideration of the highway improvements works consented as part of the Heyford Park Phase 1 development and full model output files are attached at [Appendix A](#).

Approach	AM Peak		PM Peak		SAT Peak	
	DoS	MMQ	DoS	MMQ	DoS	MMQ
B430 (south)	114.8%	70.4	95.8%	15.0	59.1%	4.7
B4030 (east)	114.3%	41.4	95.6%	21.8	58.3%	9.1
B430 (north)	71.6%	8.8	85.3%	10.2	36.5%	2.8
B4030 (west)	114.1%	56.5	98.1%	21.4	58.0%	7.7
PRC	-27.6%		-9.0%		52.2%	

Table 5.1 B430/B4030 Signalised Crossroad – 2026 Baseline with Heyford Park Phase 1

- 5.4 The analysis demonstrates that the signalised junction is likely to operate in excess of its theoretical capacity in both the weekday morning and evening peak periods.
- 5.5 Table 5.2 summarises the operation of the B430/B4030 signalised crossroads in the 2026 scenario of the with the inclusion of traffic associated with the proposed Heyford Park Phase 2 development. The assessment includes consideration of the highway improvements works consented as part of the Heyford Park Phase 1 development.

Approach	AM Peak		PM Peak		SAT Peak	
	DoS	MMQ	DoS	MMQ	DoS	MMQ
B430 (south)	131.7%	112.6	109.0%	36.7	59.1%	4.7
B4030 (east)	133.1%	79.5	111.0%	50.4	58.3%	9.1
B430 (north)	93.4%	15.3	112.3%	49.9	36.5%	2.8
B4030 (west)	135.0%	125.0	112.1%	52.7	58.0%	7.7
PRC	-50.0%		-24.8%		52.2%	

Table 5.2 B430/B4030 Signalised Crossroad – 2026 Baseline with Heyford Park Phase 2

- 5.6 The analysis demonstrates that the signalised junction is likely to operate further in excess of its theoretical capacity in both the weekday morning and evening peak periods with the addition of vehicle trips associated with Heyford Park Phase 2.

Highway Mitigation Works

- 5.7 Consideration has given to highway works at the junction to mitigate the effect of the Great Wolf development and the approach of providing a highway mitigation scheme has been agreed in principle with OCC as a mechanism to remove the objection relating to the impact of the development at the junction.
- 5.8 The assessment is based on the worst-case scenario in relation to development traffic at the junction and does not make consideration of any potential re-routeing of traffic as a result of the signage strategy.
- 5.9 A proposed scheme of works has been prepared and is presented at Drawing 1803047-17, attached at [Appendix B](#). The proposed works would be in addition to those consented as part of the Heyford Park Phase 1 and can be accommodated within the existing adopted highway at the junction. The works comprise the provision of an additional northbound dedicated left turn lane at the junction along with minor changes to the south-eastern kerbline and road markings. Full model output files are attached at [Appendix C](#).

- 5.10 Table 5.3 summarises the operation of the B430/B4030 signalised crossroads in the 2026 scenario of the with the inclusion of traffic associated with the proposed Heyford Park Phase 1 development, but without the Heyford Park Phase 2 development. The assessment includes consideration of vehicle trips associated with the Great Wolf development and the mitigation works shown at Drawing 1803047-17.

Approach	AM Peak		PM Peak		SAT Peak	
	DoS	MMQ	DoS	MMQ	DoS	MMQ
B430 (south)	112.4%	65.6	94.0%	14.3	59.2%	5.1
B4030 (east)	109.3%	34.2	95.6%	21.8	58.3%	9.1
B430 (north) (ahead, left)	68.4%	8.0	81.2%	9.3	36.0%	2.8
B430 (north) (right)	8.3%	0.2	32.2%	1.0	110.6%	0.5
B4030 (west)	114.1%	56.5	95.2%	19.0	59.8%	7.8
PRC	-26.8%		-6.3%		50.5%	

Table 5.3 B430/B4030 Signalised Crossroads with Heyford Park Phase 1, Great Wolf and Mitigation

- 5.11 Table 5.3 demonstrates that, whilst the junction will continue to operate in excess of its theoretical capacity during the weekday morning and evening peak periods, the junction would have improved operation in comparison with the analysis of the baseline scenario presented at Table 5.1. It is therefore concluded that the proposed highway works mitigate the impact of vehicles associated with the proposed development.
- 5.12 Table 5.4 summarises the operation of the B430/B4030 signalised crossroads in the 2026 scenario of the with the inclusion of traffic associated with both the Heyford Park Phase 1 and Phase 2 developments. The assessment includes consideration of vehicle trips associated with the Great Wolf development and the mitigation works shown at Drawing 1803047-17.

Approach	AM Peak		PM Peak		SAT Peak	
	DoS	MMQ	DoS	MMQ	DoS	MMQ
B430 (south)	131.7%	117.0	110.3%	42.8	60.8%	5.7
B4030 (east)	127.6%	71.5	111.0%	50.4	61.9%	9.4
B430 (north) (ahead, left)	86.1%	11.4	105.2%	32.3	39.6%	3.3
B430 (north) (right)	8.3%	0.3	32.2%	1.0	10.4%	0.5
B4030 (west)	131.8%	118.2	109.1%	46.6	61.7%	7.9
PRC	-46.5%		-23.4%		45.5%	

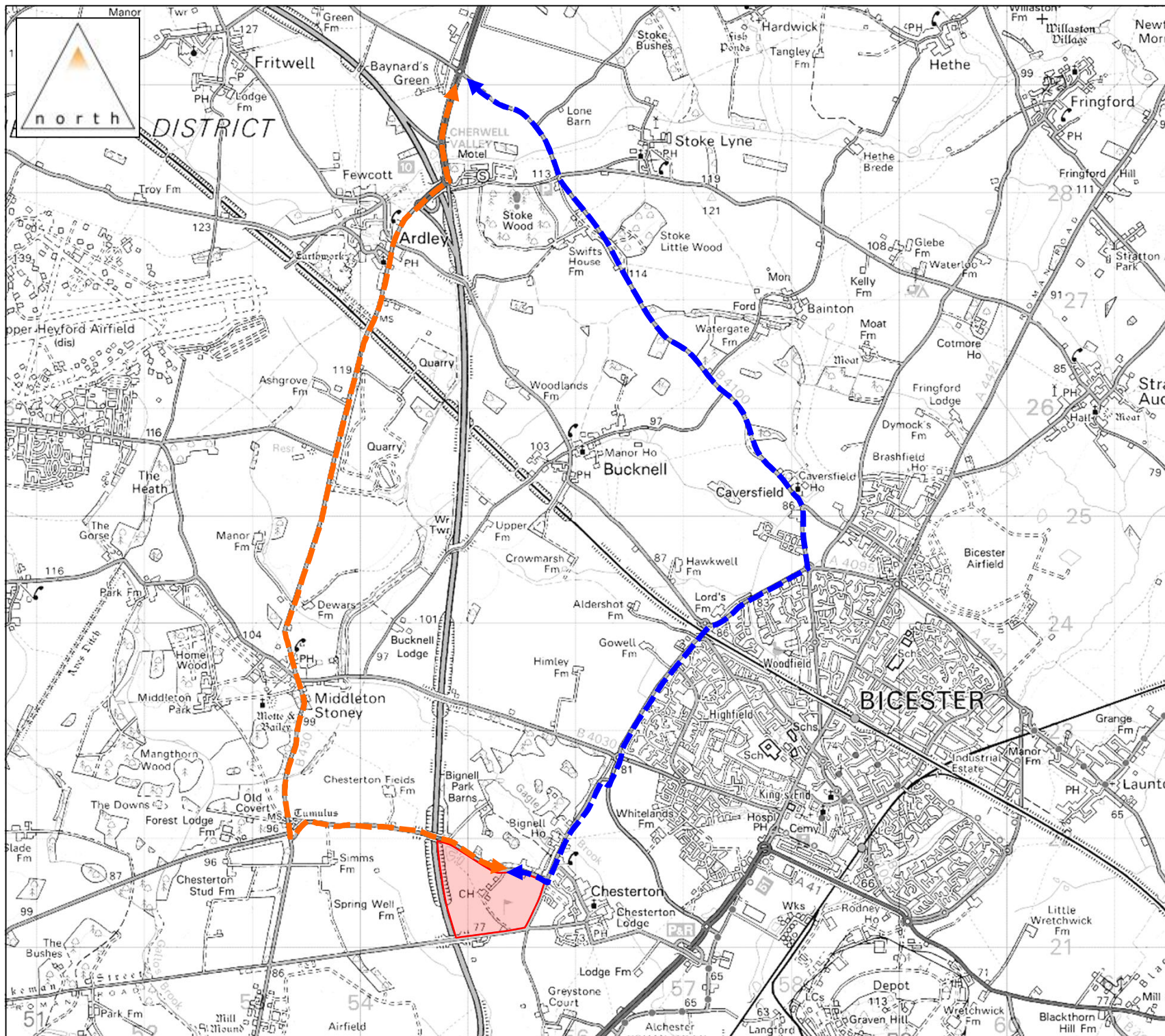
Table 5.4 B430/B4030 Signalised Crossroads with Heyford Park Phase 2, Great Wolf and Mitigation

- 5.13 Table 5.4 demonstrates that, whilst the junction will continue to operate in excess of its theoretical capacity during the weekday morning and evening peak periods, the junction would have improved operation in comparison with the analysis of the baseline with Heyford Park Phase 2 scenario as presented at Table 5.2. It is therefore concluded that, in the scenario with the Heyford Park Phase 2 development include, the proposed highway works mitigate the impact of vehicles associated with the proposed development.
- 5.14 The applicant is prepared to either implement the mitigation scheme in the event that the consented Phase 1 works are complete prior to occupation, implement both the mitigation scheme and the consented Phase 1 works in the event that the Phase 1 works are not complete prior to occupation, or pay a contribution equivalent to the cost of the works. OCC can confirm which approach they would wish to adopt.

6.0 Summary and Conclusions

- 6.1 Motion has been instructed by Great Wolf Resorts (the parent company of Great Wolf Lodge) to advise on highways and transport matters associated with development proposals for a new family resort at a site in Chesterton near Bicester.
- 6.2 Following submission of the Great Wolf planning application and receipt of a revised response to the development proposals, this Note has considered public transport contributions, cycle network contributions and the perceived impact of the development proposals on a signalised junction in Middleton Stoney.
- 6.3 In summary this Note demonstrates that:
- ▶ Motion maintains the position that that a shuttle bus service is the most appropriate approach to promoting access to the development by public transport and the applicant has confirmed that they will continue to provide a shuttle bus service associated with the proposed development;
 - ▶ Notwithstanding this and, in the interests of reaching a timely resolution to this matter and those relating to the impact of the B430/B4030 junction in Middleton Stoney, the applicant is satisfied to accept the requested £1.6 million contribution towards a new public bus service, as requested by OCC, subject to confirmation of payment schedule for the contribution to be agreed during S106 negotiations;
 - ▶ The applicant is satisfied to accept a S106 contribution of £70,000 towards improvements to the cycle route between the development and Bicester;
 - ▶ The applicant has agreed to provide a contribution towards a coordinated signage strategy and it has been demonstrated that the signage strategy could be developed in a manner to seek to minimise the number of trips associated with the development using the B430; and,
 - ▶ Proposals for highway mitigation works at the B430/B4030 junction, as presented at Drawing 1803047-17 would mitigate the effect of the proposed development at his junction.
- 6.4 On the basis of the above, this Technical Note demonstrates that the development proposals accord with the principles of sustainable development set out within the NPPF and would not result in a severe impact on the highway network. It is concluded that the matters raised by OCC, in their consultation response to the planning application, can be dealt with through appropriate highway works, planning conditions and S106 obligations (to be agreed) and there are no reasons why the current planning application should be resisted or refused on sustainability, transport or highways grounds.

Figures



- Legend:
- ▭ Site Location
 - ↔ Current Routing
 - ↔ Alternative Routing

Great Wolf,
Bicester
Figure 3.1 Alternative Vehicle
Routing
Not to Scale



Appendix A

Model Output File – Heyford Park (Phase 1) Signal Arrangement

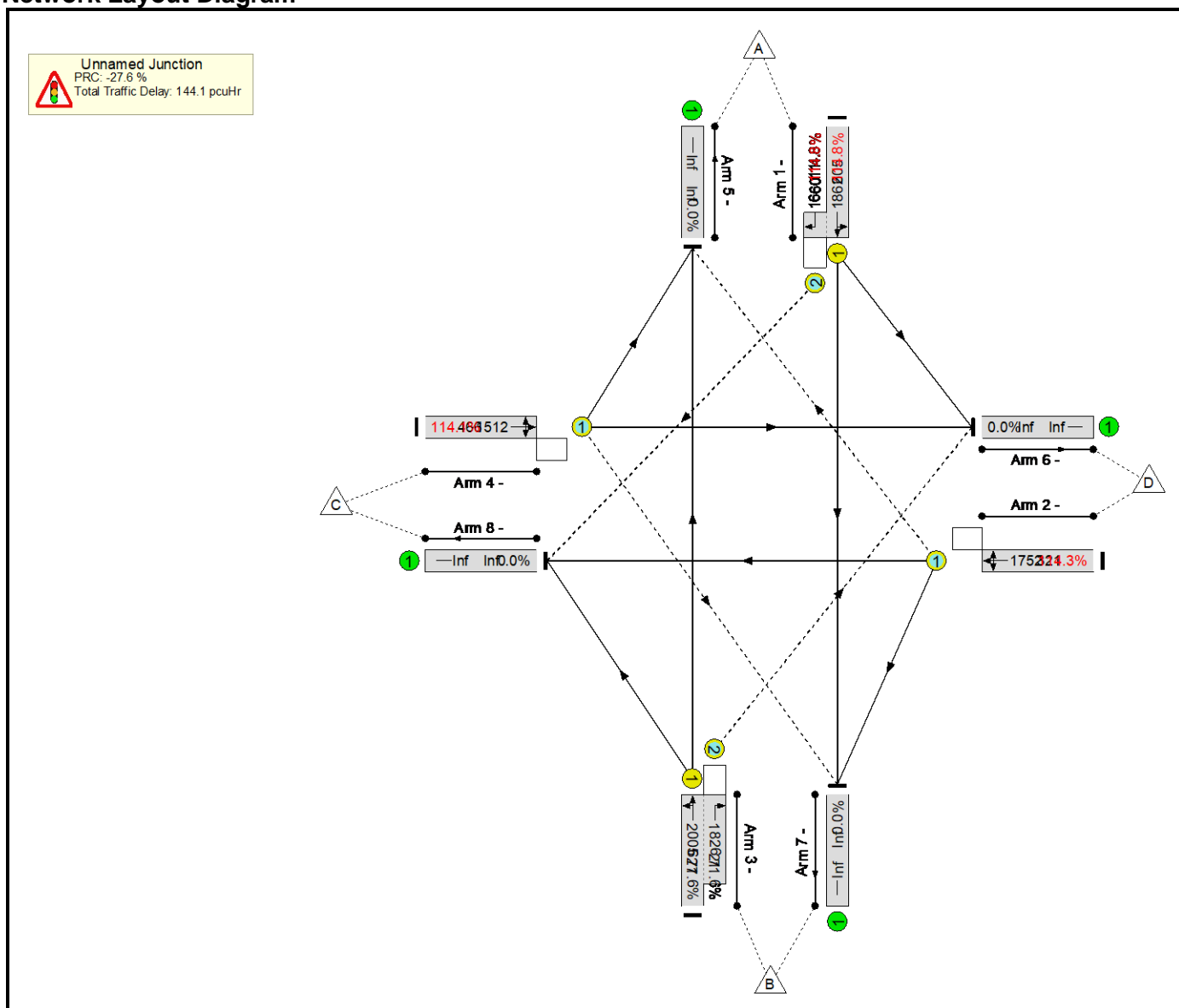
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	Great Wolf Lodge, Chesterton
Title:	Consented Heyford Park (Phase 1) Signal Arrangement
Location:	B430/B4030 Signals, Middleton Stoney
Additional detail:	
File name:	Consented Heyford Park (Phase 1) Signal Arrangement
Author:	KL
Company:	Motion
Address:	

Scenario 1: 'BTM AM' (FG1: 'BTM AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

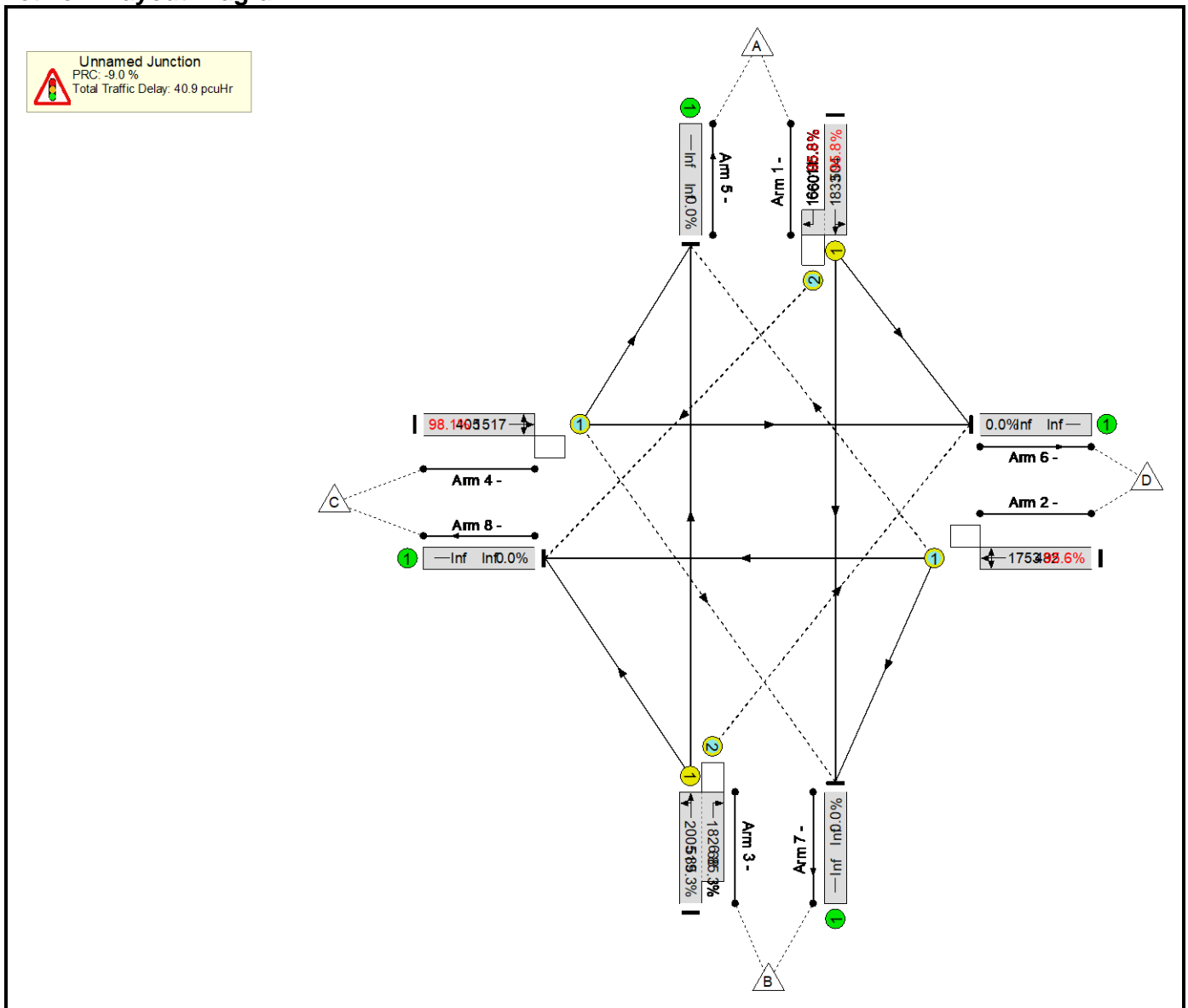
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	114.8%	8	81	25	144.1	-	-	
Unnamed Junction	-	-	-		-	-	-	-	-	-	114.8%	8	81	25	144.1	-	-	
1/1+1/2	Left Ahead Right	U+O	B		2	37	-	708	1862:1660	605+11	114.8 : 114.8%	8	0	4	59.5	302.8	70.4	
2/1	Right Left Ahead	O	D		1	21	-	367	1752	321	114.3%	0	37	4	34.5	338.8	41.4	
3/1+3/2	Ahead Right Left	U+O	A		2	36	-	464	2005:1826	627+21	71.6 : 71.6%	0	0	15	3.7	28.7	8.8	
4/1	Left Ahead Right	O	C		1	36	-	532	1512	466	114.1%	0	44	3	46.3	313.1	56.5	
C1					PRC for Signalled Lanes (%):		-27.6		Total Delay for Signalled Lanes (pcuHr):			144.05		Cycle Time (s): 120				
					PRC Over All Lanes (%):		-27.6		Total Delay Over All Lanes(pcuHr):			144.05						

Basic Results Summary

Scenario 2: 'BTM PM' (FG2: 'BTM PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

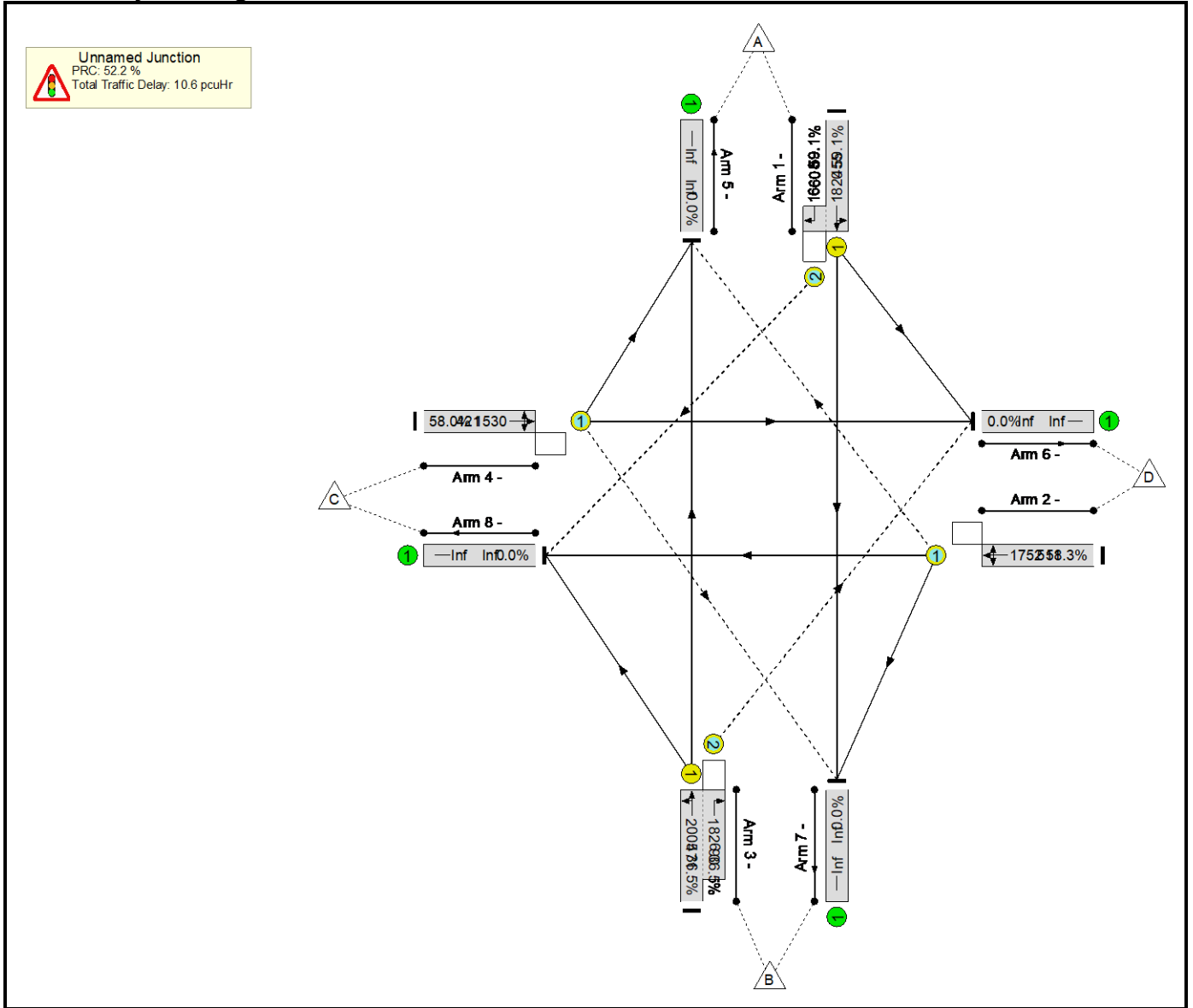
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	98.1%	25	59	46	40.9	-	-	
Unnamed Junction	-	-	-		-	-	-	-	-	-	98.1%	25	59	46	40.9	-	-	
1/1+1/2	Left Ahead Right	U+O	B		2	31	-	494	1833:1660	504+11	95.8 : 95.8%	11	0	0	9.9	72.3	15.0	
2/1	Right Left Ahead	O	D		1	32	-	461	1753	482	95.6%	0	12	0	12.2	95.0	21.8	
3/1+3/2	Ahead Right Left	U+O	A		2	30	-	501	2005:1826	519+68	85.3 : 85.3%	14	0	44	5.8	41.5	10.2	
4/1	Left Ahead Right	O	C		1	31	-	397	1517	405	98.1%	0	47	2	13.1	118.6	21.4	
C1					PRC for Signalled Lanes (%): -9.0			-9.0		Total Delay for Signalled Lanes (pcuHr): 40.94			40.94		Cycle Time (s): 120			
					PRC Over All Lanes (%): -9.0					Total Delay Over All Lanes(pcuHr): 40.94								

Basic Results Summary

Scenario 3: '2026 SAT' (FG3: '2026 SAT', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

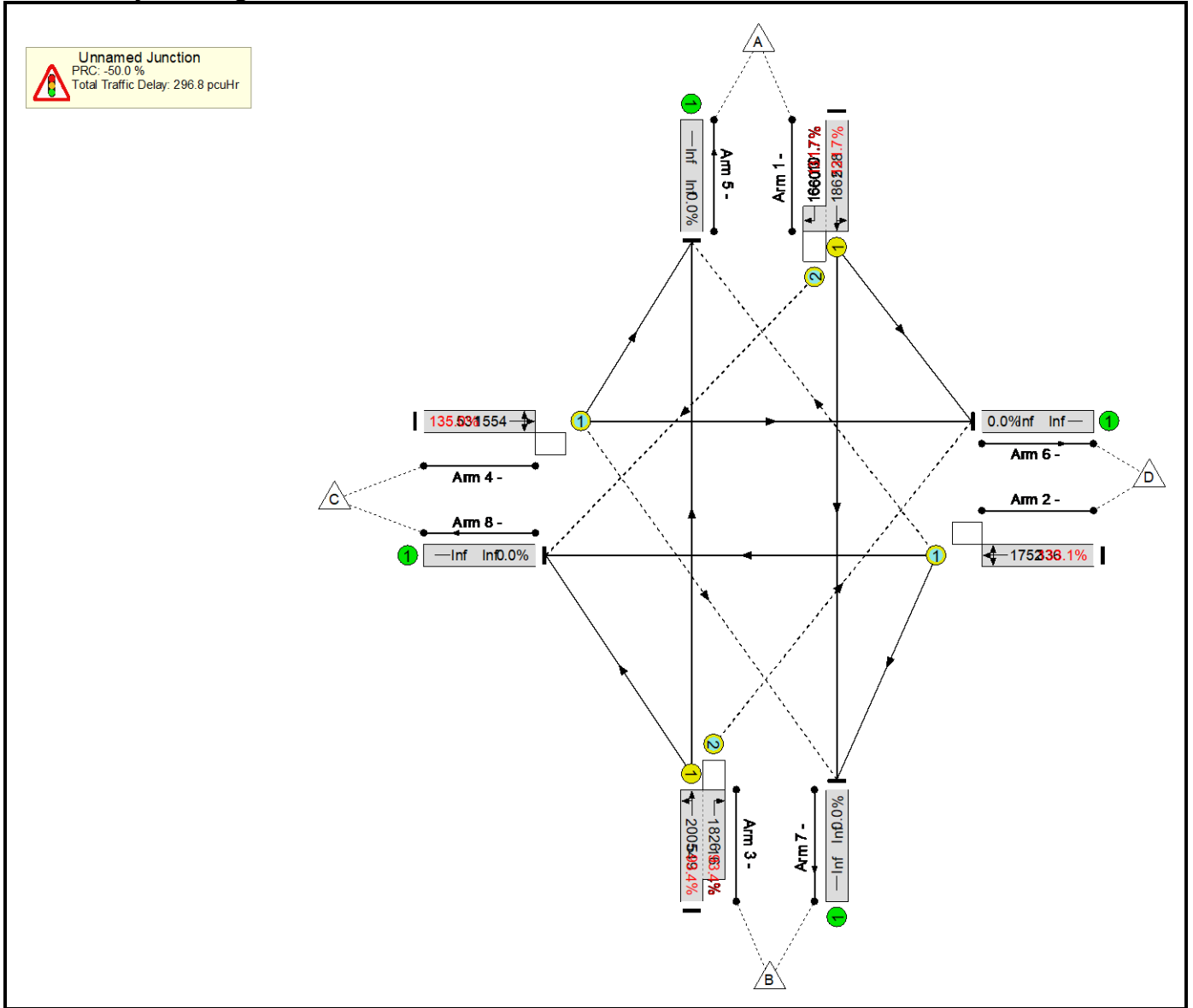
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	59.1%	38	67	1	10.6	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	59.1%	38	67	1	10.6	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	28	-	274	1820:1660	455+8	59.1 : 59.1%	5	0	0	2.2	29.3	4.7
2/1	Right Left Ahead	O	D		1	34	-	298	1752	511	58.3%	0	33	1	3.7	44.7	9.1
3/1+3/2	Ahead Right Left	U+O	A		2	27	-	205	2005:1826	471+90	36.5 : 36.5%	33	0	0	1.4	24.8	2.8
4/1	Left Ahead Right	O	C		1	32	-	244	1530	421	58.0%	0	33	1	3.2	47.6	7.7
C1					PRC for Signalled Lanes (%):		52.2	Total Delay for Signalled Lanes (pcuHr):		10.57	Cycle Time (s): 120						
					PRC Over All Lanes (%):		52.2	Total Delay Over All Lanes(pcuHr):		10.57							

Basic Results Summary

Scenario 4: 'BTM + Heyford AM' (FG7: 'BTM + Heyford AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

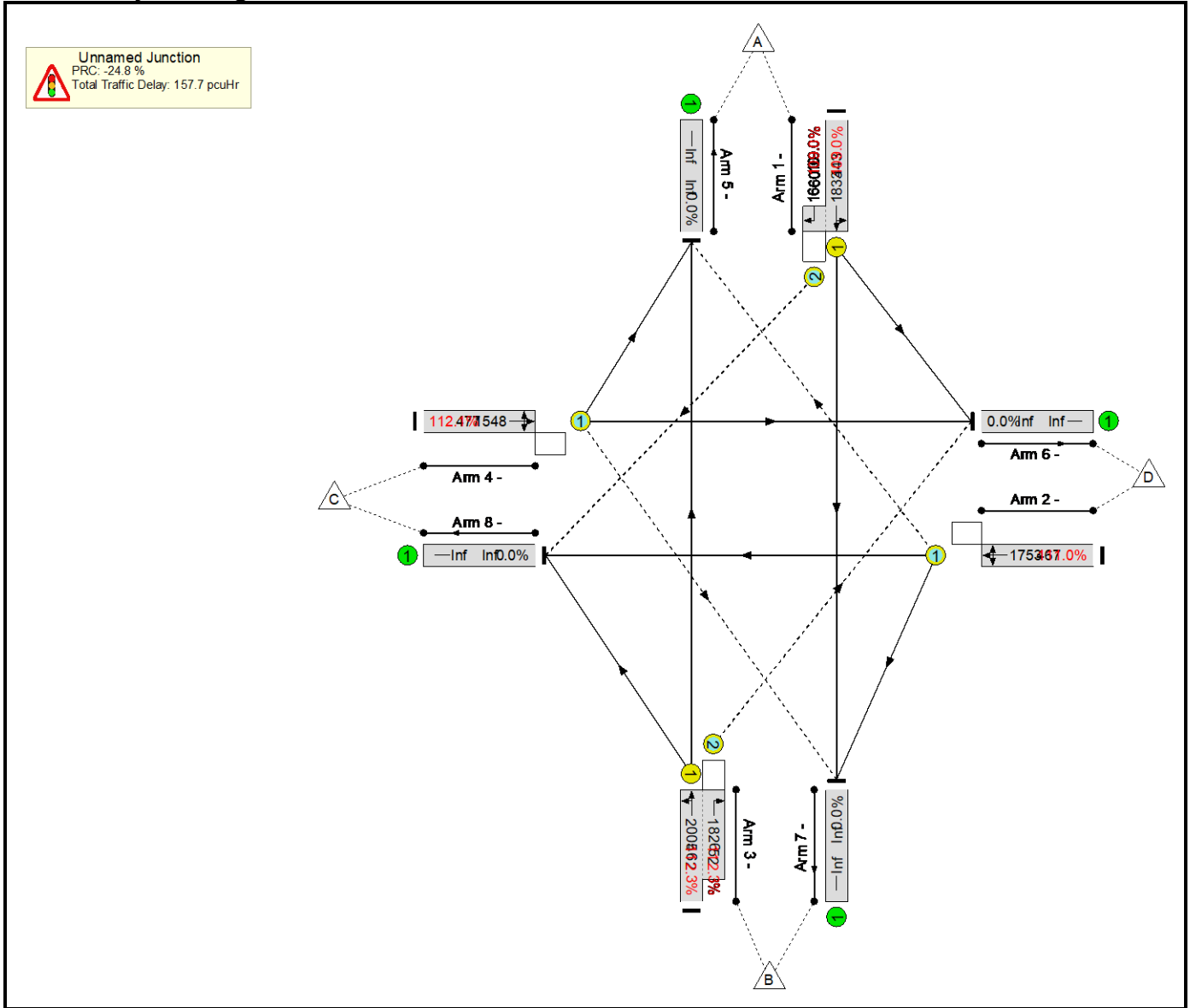
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	135.0%	10	141	24	296.8	-	-	
Unnamed Junction	-	-	-		-	-	-	-	-	-	135.0%	10	141	24	296.8	-	-	
1/1+1/2	Left Ahead Right	U+O	B		2	32	-	708	1862:1660	528+10	131.7 : 131.7%	10	0	0	104.2	529.9	112.6	
2/1	Right Left Ahead	O	D		1	22	-	447	1752	336	133.1%	0	32	3	71.3	573.9	79.5	
3/1+3/2	Ahead Right Left	U+O	A		2	31	-	528	2005:1826	549+16	93.4 : 93.4%	0	0	15	8.7	59.5	15.3	
4/1	Left Ahead Right	O	C		1	40	-	717	1554	531	135.0%	0	109	6	112.7	565.6	125.0	
C1					PRC for Signalled Lanes (%):		-50.0	Total Delay for Signalled Lanes (pcuHr):			296.84	Cycle Time (s):			120			
					PRC Over All Lanes (%):		-50.0	Total Delay Over All Lanes(pcuHr):			296.84							

Basic Results Summary

Scenario 5: 'BTM + Heyford PM' (FG8: 'BTM + Heyford PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

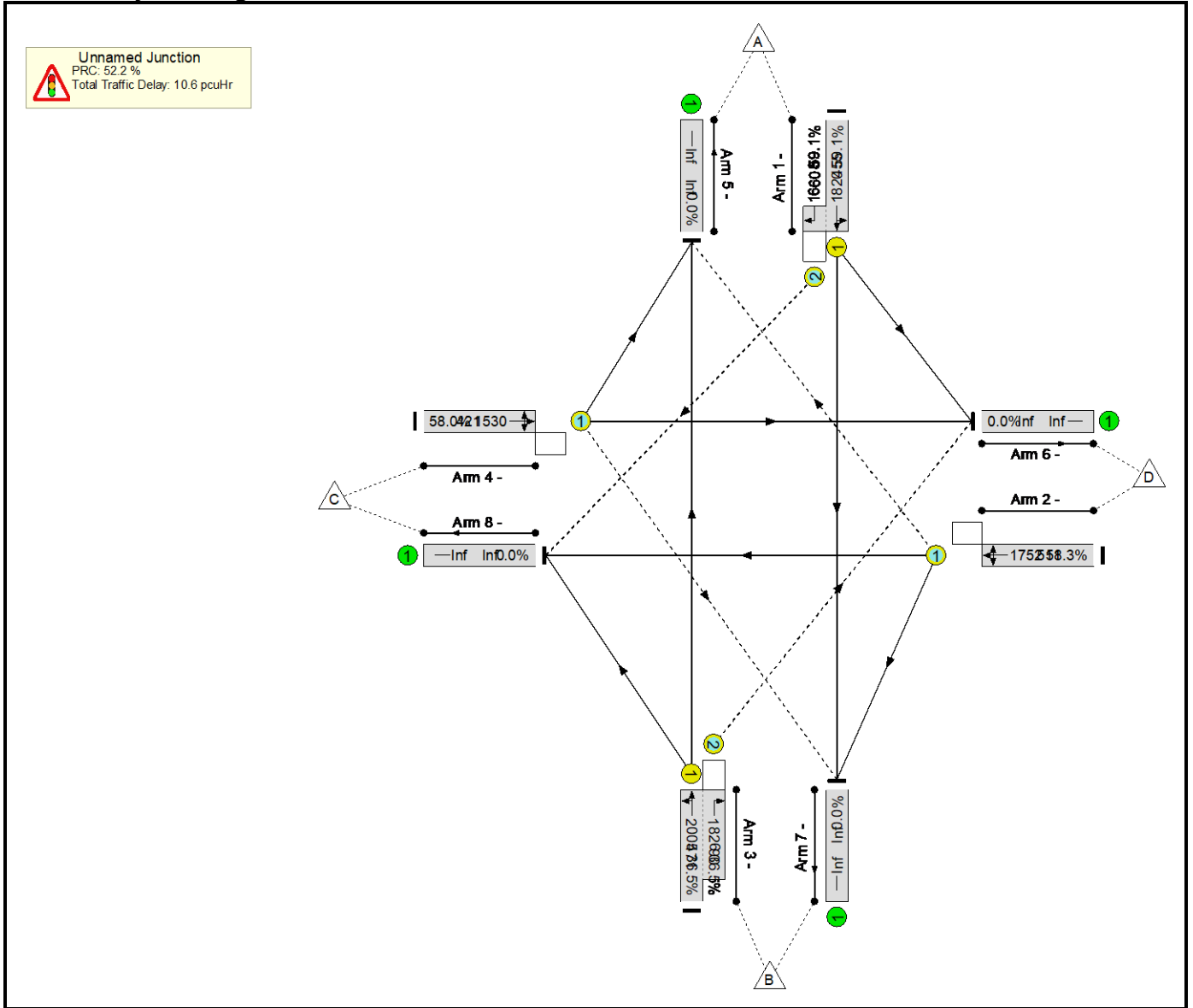
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	112.3%	0	105	68	157.7	-	-	
Unnamed Junction	-	-	-		-	-	-	-	-	-	112.3%	0	105	68	157.7	-	-	
1/1+1/2	Left Ahead Right	U+O	B		2	27	-	494	1833:1660	443+10	109.0 : 109.0%	0	0	10	31.6	230.6	36.7	
2/1	Right Left Ahead	O	D		1	31	-	519	1753	467	111.0%	0	10	1	40.1	277.8	50.4	
3/1+3/2	Ahead Right Left	U+O	A		2	26	-	577	2005:1826	462+52	112.3 : 112.3%	0	0	52	43.8	273.3	49.9	
4/1	Left Ahead Right	O	C		1	36	-	535	1548	477	112.1%	0	95	5	42.2	283.9	52.7	
C1					PRC for Signalled Lanes (%):		-24.8		Total Delay for Signalled Lanes (pcuHr):			157.69		Cycle Time (s): 120				
					PRC Over All Lanes (%):		-24.8		Total Delay Over All Lanes(pcuHr):			157.69						

Basic Results Summary

Scenario 6: '2026 + Heyford SAT' (FG9: '2026 + Heyford SAT', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



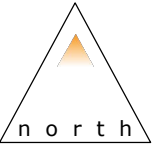
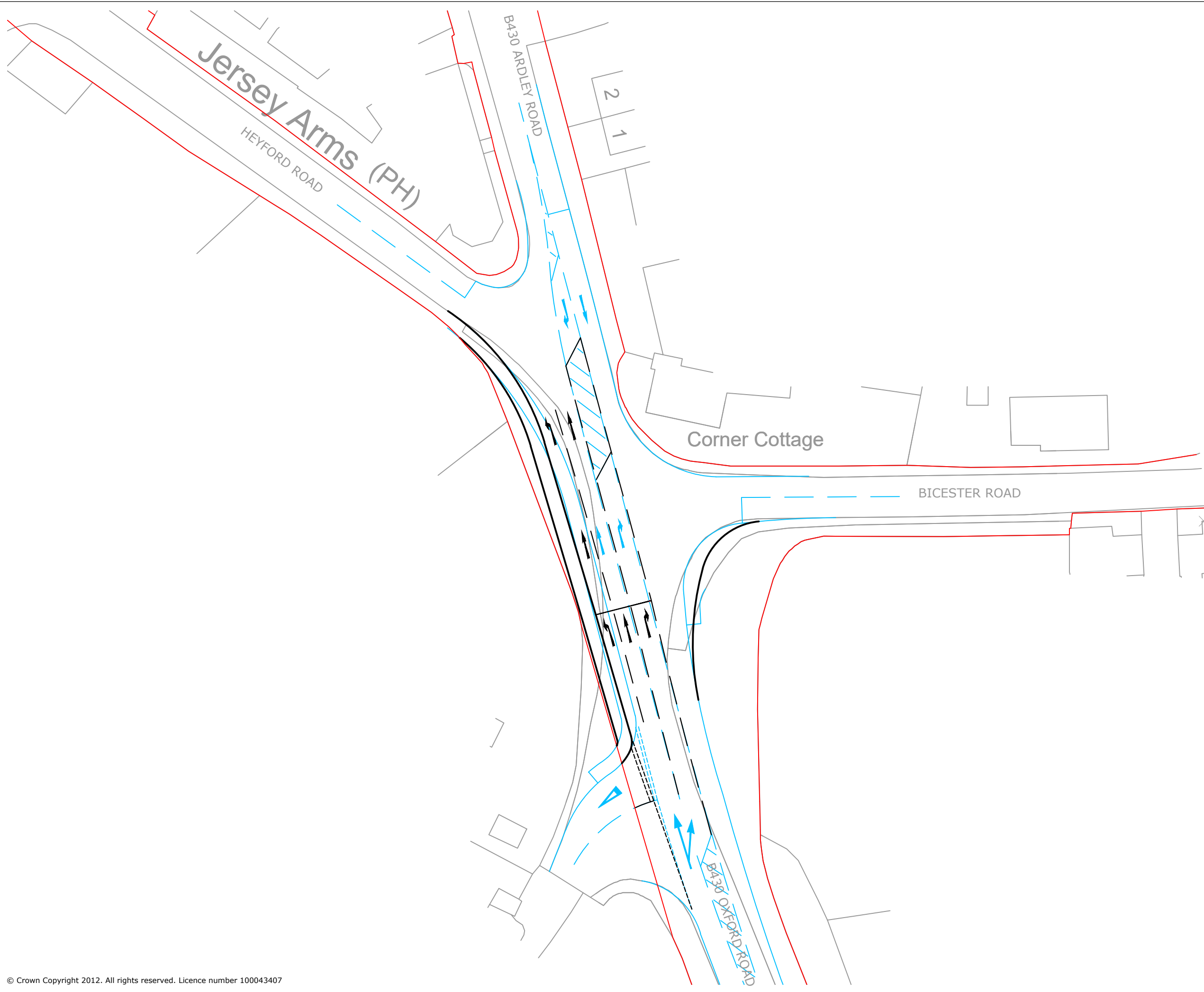
Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	59.1%	38	67	1	10.6	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	59.1%	38	67	1	10.6	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	28	-	274	1820:1660	455+8	59.1 : 59.1%	5	0	0	2.2	29.3	4.7
2/1	Right Left Ahead	O	D		1	34	-	298	1752	511	58.3%	0	33	1	3.7	44.7	9.1
3/1+3/2	Ahead Right Left	U+O	A		2	27	-	205	2005:1826	471+90	36.5 : 36.5%	33	0	0	1.4	24.8	2.8
4/1	Left Ahead Right	O	C		1	32	-	244	1530	421	58.0%	0	33	1	3.2	47.6	7.7
C1					PRC for Signalled Lanes (%):		52.2	Total Delay for Signalled Lanes (pcuHr):		10.57	Cycle Time (s): 120						
					PRC Over All Lanes (%):		52.2	Total Delay Over All Lanes(pcuHr):		10.57							

Appendix B

Indicative Mitigation Works



Legend:

- Consented Heyford Park Phase 1 Highway Works —
- Highway Boundary —



84 North Street
 Guildford
 Surrey
 GU1 4AU
 T: 01483 531 300

Cargo Works
 1-2 Hatfields
 London
 SE1 9PG
 T: 020 8065 5208

www.motion.co.uk

Project:
Great Wolf Resort. Bicester

Title:
Indicative Mitigation Works

Scale: 1:500 (@ A3)

Drawing:
1803047-17

Revision:
 -

N:\Projects\gw\1803047\Drawings\1803047-17.dwg

Appendix C

Model Output File – Middleton Stoney Mitigation Option

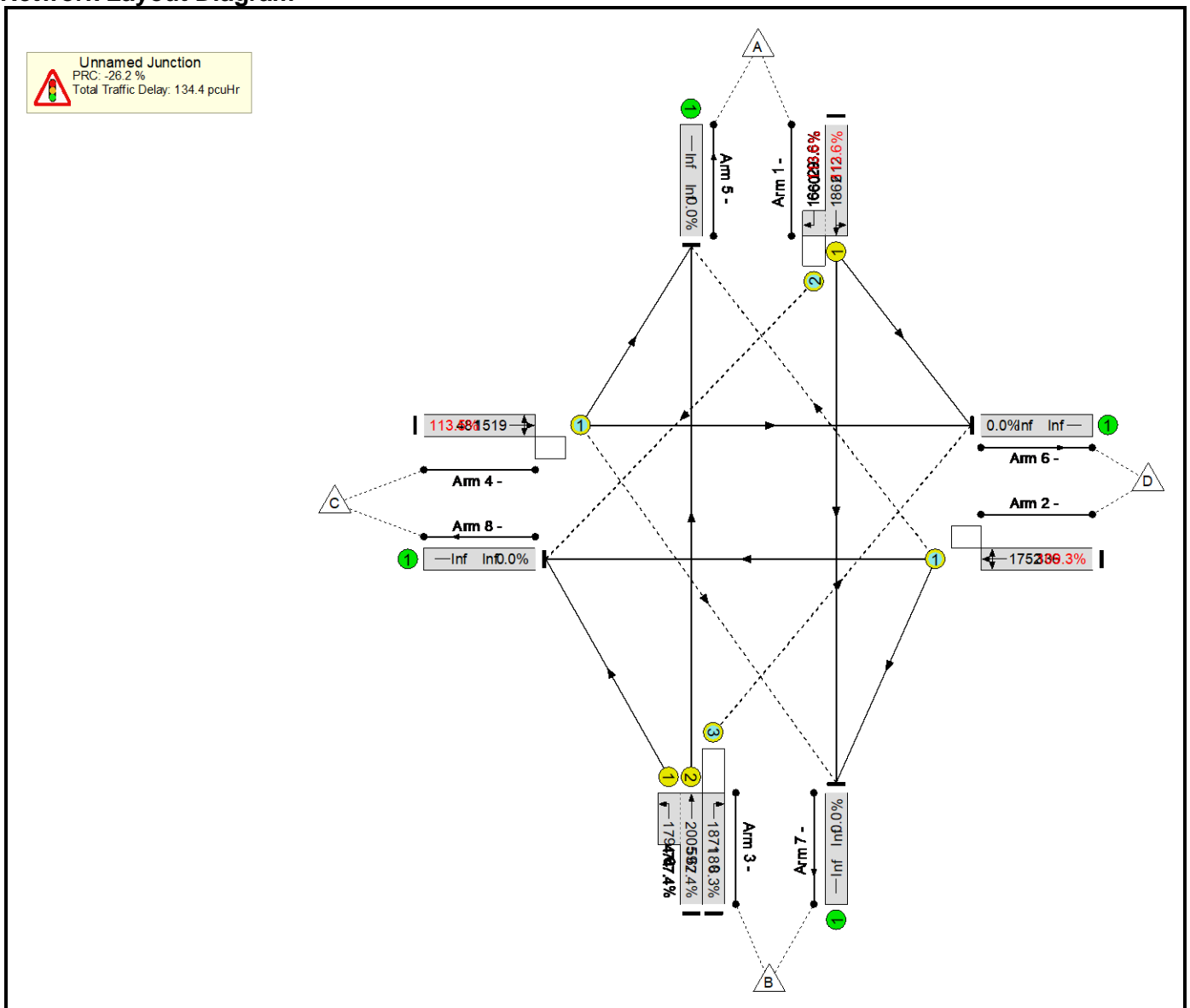
Basic Results Summary
Basic Results Summary

User and Project Details

Project:	Great Wolf Lodge, Chesterton
Title:	Middleton Stoney Mitigation Option
Location:	B430/B4030 Signals, Middleton Stoney
Additional detail:	
File name:	Middleton Stoney Mitigation Option
Author:	KL
Company:	Motion
Address:	

Scenario 1: 'BTM + GW AM' (FG10: 'BTM + GW AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

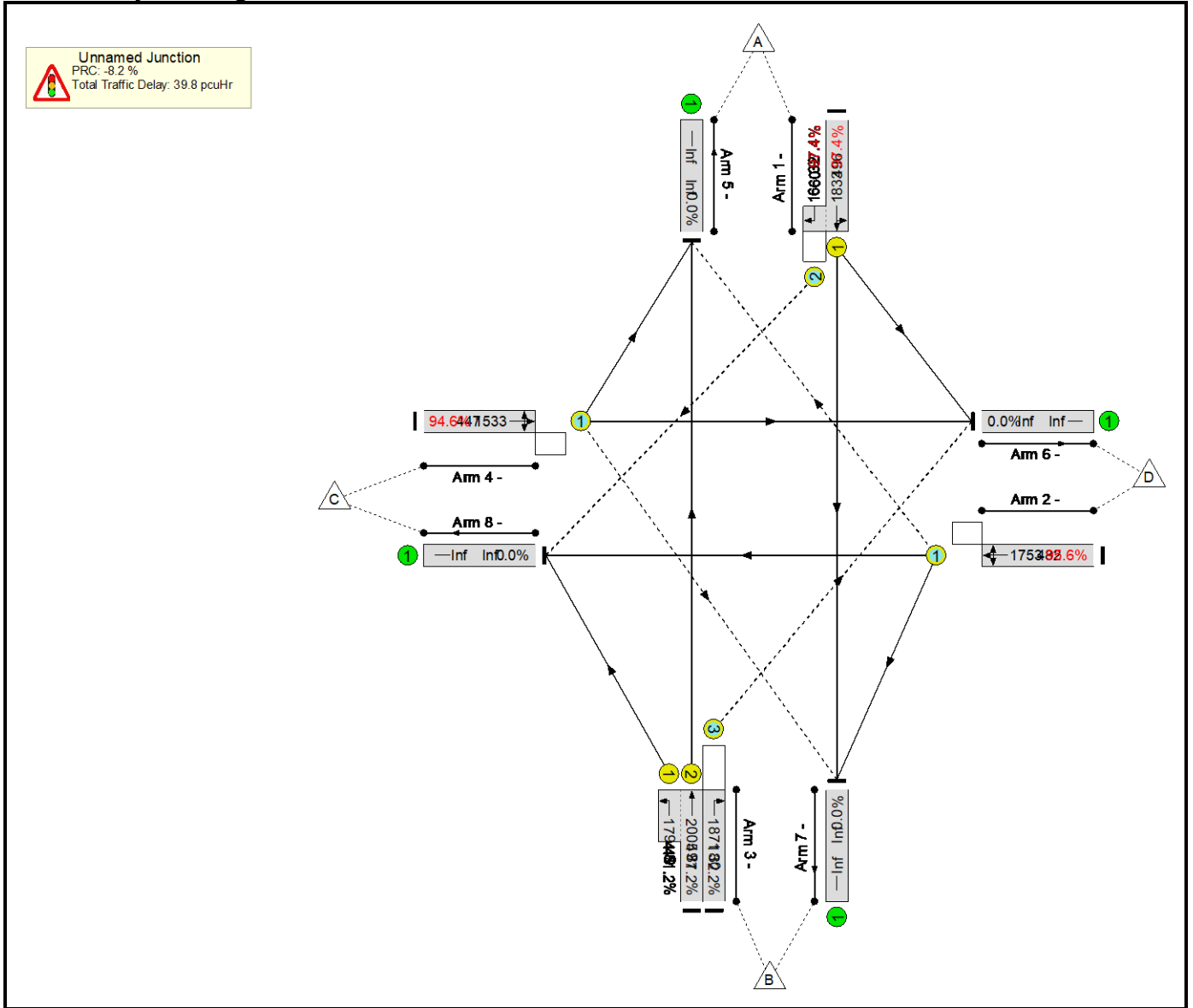
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	113.6%	27	84	23	134.4	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	113.6%	27	84	23	134.4	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	38	-	728	1862:1660	612+29	113.6 : 113.6%	27	1	1	57.7	285.5	68.2
2/1	Right Left Ahead	O	D		1	22	-	367	1752	336	109.3%	0	39	4	27.3	267.4	34.2
3/2+3/1	Ahead Left	U	A		2	35	-	449	2005:1794	592+74	67.4 : 67.4%	-	-	-	3.3	26.3	7.8
3/3	Right	O	A		2	35	-	15	1871	180	8.3%	0	0	15	0.2	42.6	0.2
4/1	Left Ahead Right	O	C		1	37	-	546	1519	481	113.5%	0	44	2	46.0	303.1	56.6
C1					PRC for Signalled Lanes (%):		-26.2	Total Delay for Signalled Lanes (pcuHr):			134.42	Cycle Time (s): 120					
					PRC Over All Lanes (%):		-26.2	Total Delay Over All Lanes(pcuHr):			134.42						

Basic Results Summary

Scenario 2: 'BTM + GW PM' (FG11: 'BTM + GW PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

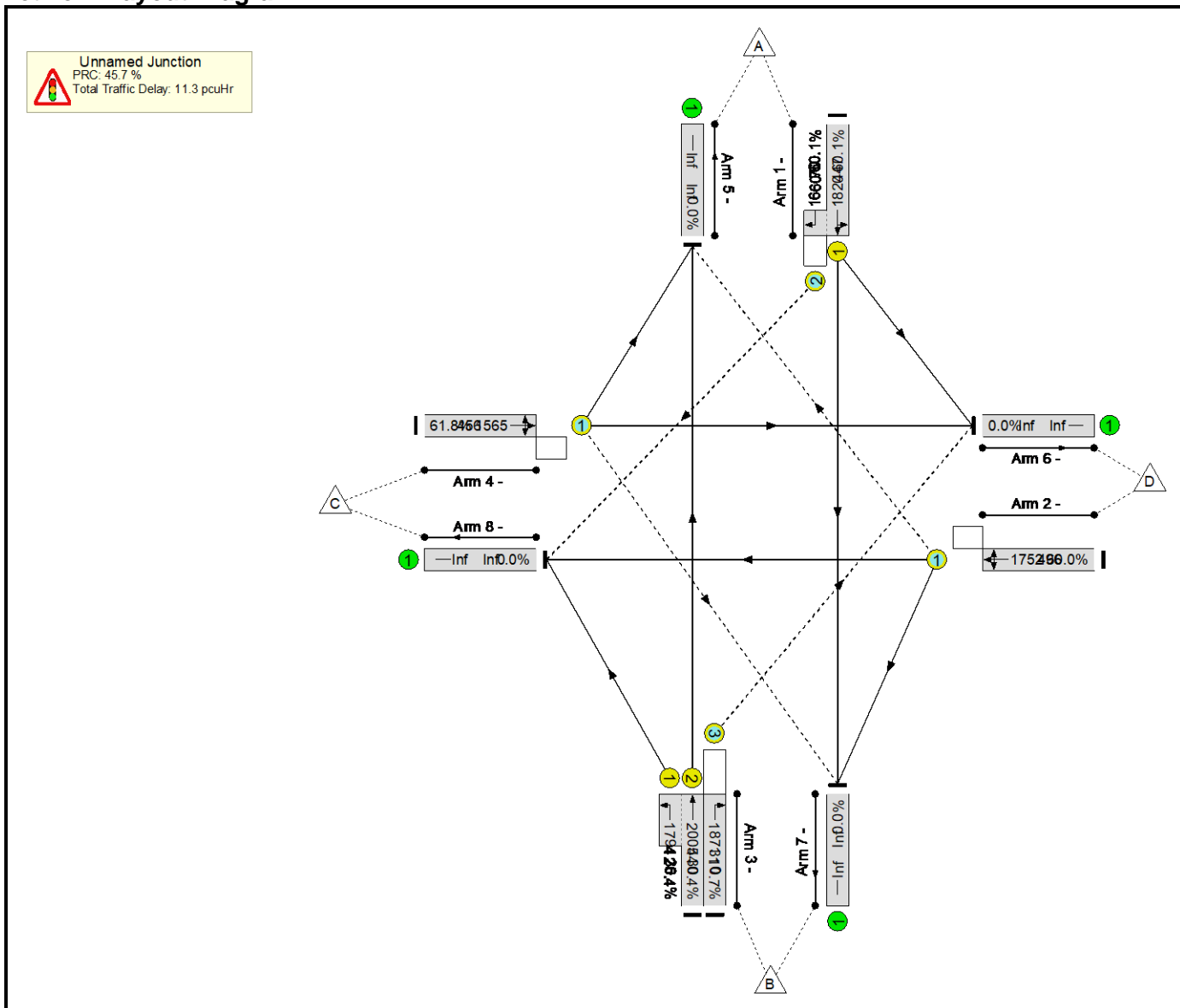
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	97.4%	38	61	51	39.8	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	97.4%	38	61	51	39.8	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	31	-	514	1833:1660	496+32	97.4 : 97.4%	28	1	2	11.5	80.5	17.1
2/1	Right Left Ahead	O	D		1	32	-	461	1753	482	95.6%	0	12	0	12.2	95.0	21.8
3/2+3/1	Ahead Left	U	A		2	28	-	443	2005:1794	497+49	81.2 : 81.2%	-	-	-	4.7	37.8	8.7
3/3	Right	O	A		2	28	-	58	1871	180	32.2%	10	0	48	0.7	45.3	1.0
4/1	Left Ahead Right	O	C		1	34	-	423	1533	447	94.6%	0	48	1	10.8	91.7	19.6
C1					PRC for Signalled Lanes (%):		-8.2	Total Delay for Signalled Lanes (pcuHr):			39.82	Cycle Time (s): 120					
					PRC Over All Lanes (%):		-8.2	Total Delay Over All Lanes(pcuHr):			39.82						

Basic Results Summary

Scenario 3: '2026 + GW SAT' (FG12: '2026 + GW SAT', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

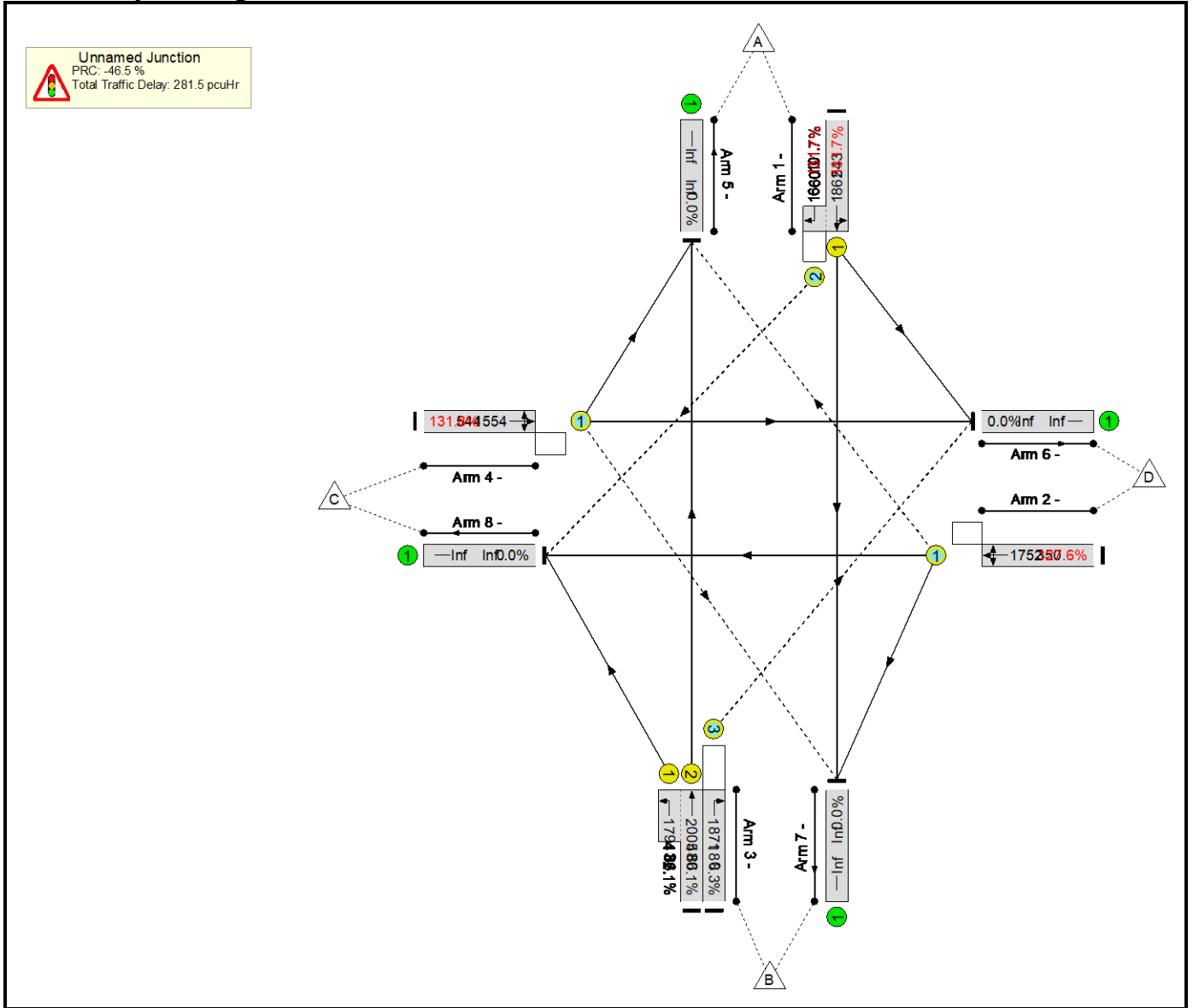
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	61.8%	73	67	2	11.3	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	61.8%	73	67	2	11.3	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	30	-	311	1820:1660	447+70	60.1 : 60.1%	41	1	1	2.4	27.8	5.1
2/1	Right Left Ahead	O	D		1	33	-	298	1752	496	60.0%	0	33	1	3.8	46.1	9.3
3/2+3/1	Ahead Left	U	A		2	27	-	172	2005:1794	440+125	30.4 : 30.4%	-	-	-	1.1	22.9	2.1
3/3	Right	O	A		2	27	-	33	1871	310	10.7%	32	0	1	0.3	29.4	0.5
4/1	Left Ahead Right	O	C		1	34	-	282	1565	456	61.8%	0	33	1	3.7	46.9	8.9
C1					PRC for Signalled Lanes (%):		45.7	Total Delay for Signalled Lanes (pcuHr):		11.26		Cycle Time (s): 120					
					PRC Over All Lanes (%):		45.7	Total Delay Over All Lanes(pcuHr):		11.26							

Basic Results Summary

Scenario 4: 'BTM + P2 + Dev AM' (FG7: 'BTM + P2 + Dev AM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

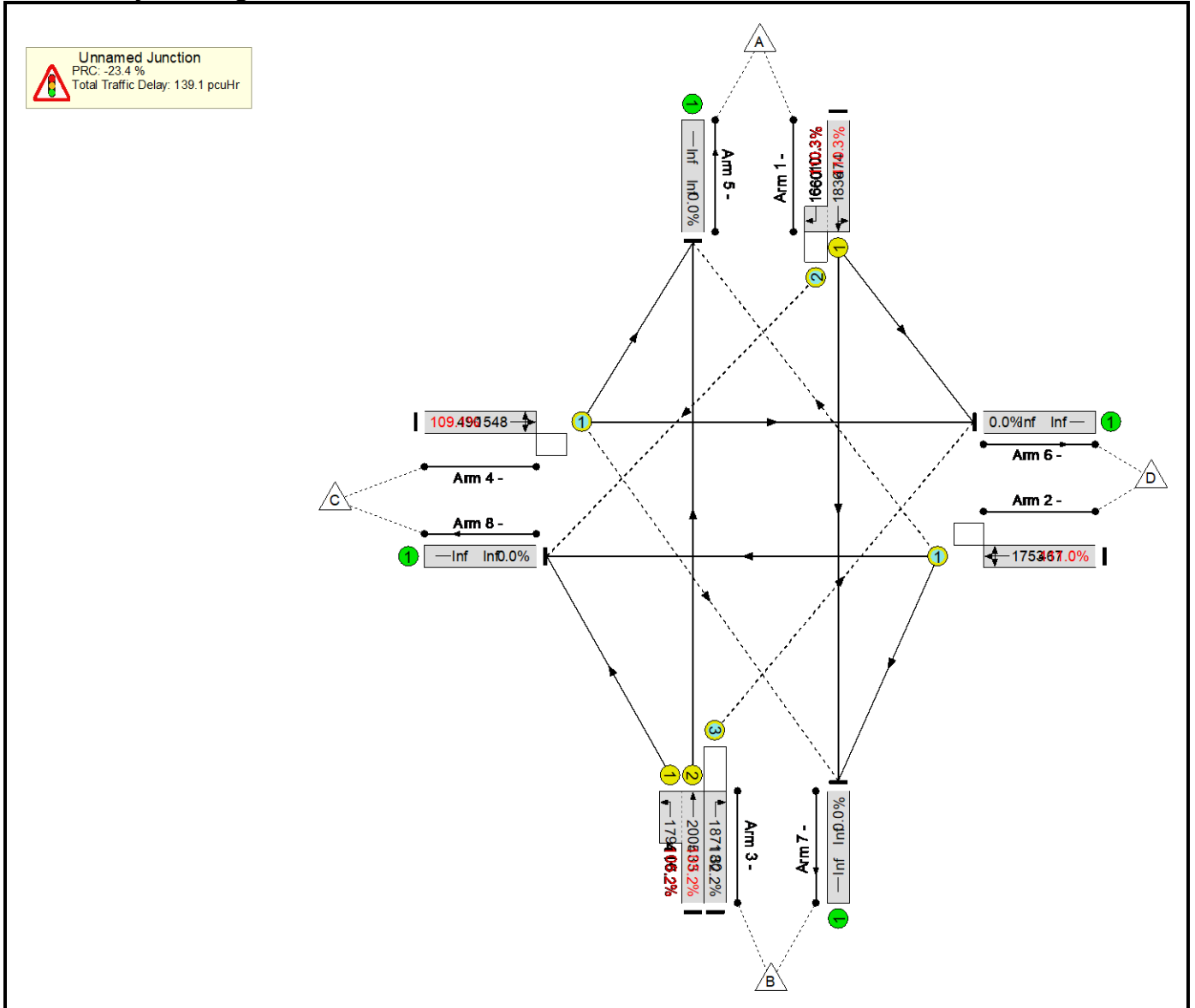
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)	
Network	-	-	-		-	-	-	-	-	-	131.8%	6	146	27	281.5	-	-	
Unnamed Junction	-	-	-		-	-	-	-	-	-	131.8%	6	146	27	281.5	-	-	
1/1+1/2	Left Ahead Right	U+O	B		2	33	-	728	1862:1660	543+10	131.7 : 131.7%	6	0	4	106.5	526.4	117.0	
2/1	Right Left Ahead	O	D		1	23	-	447	1752	350	127.6%	0	34	3	63.2	508.7	71.5	
3/2+3/1	Ahead Left	U	A		2	30	-	527	2005:1794	480+132	86.1 : 86.1%	-	-	-	6.0	40.7	11.4	
3/3	Right	O	A		2	30	-	15	1871	180	8.3%	0	0	15	0.2	43.3	0.3	
4/1	Left Ahead Right	O	C		1	41	-	717	1554	544	131.8%	0	112	6	105.7	530.9	118.2	
C1					PRC for Signalled Lanes (%):		-46.5		Total Delay for Signalled Lanes (pcuHr):			281.51		Cycle Time (s): 120				
					PRC Over All Lanes (%):		-46.5		Total Delay Over All Lanes(pcuHr):			281.51						

Basic Results Summary

Scenario 5: 'BTM + P2 + Dev PM' (FG8: 'BTM + P2 + Dev PM', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

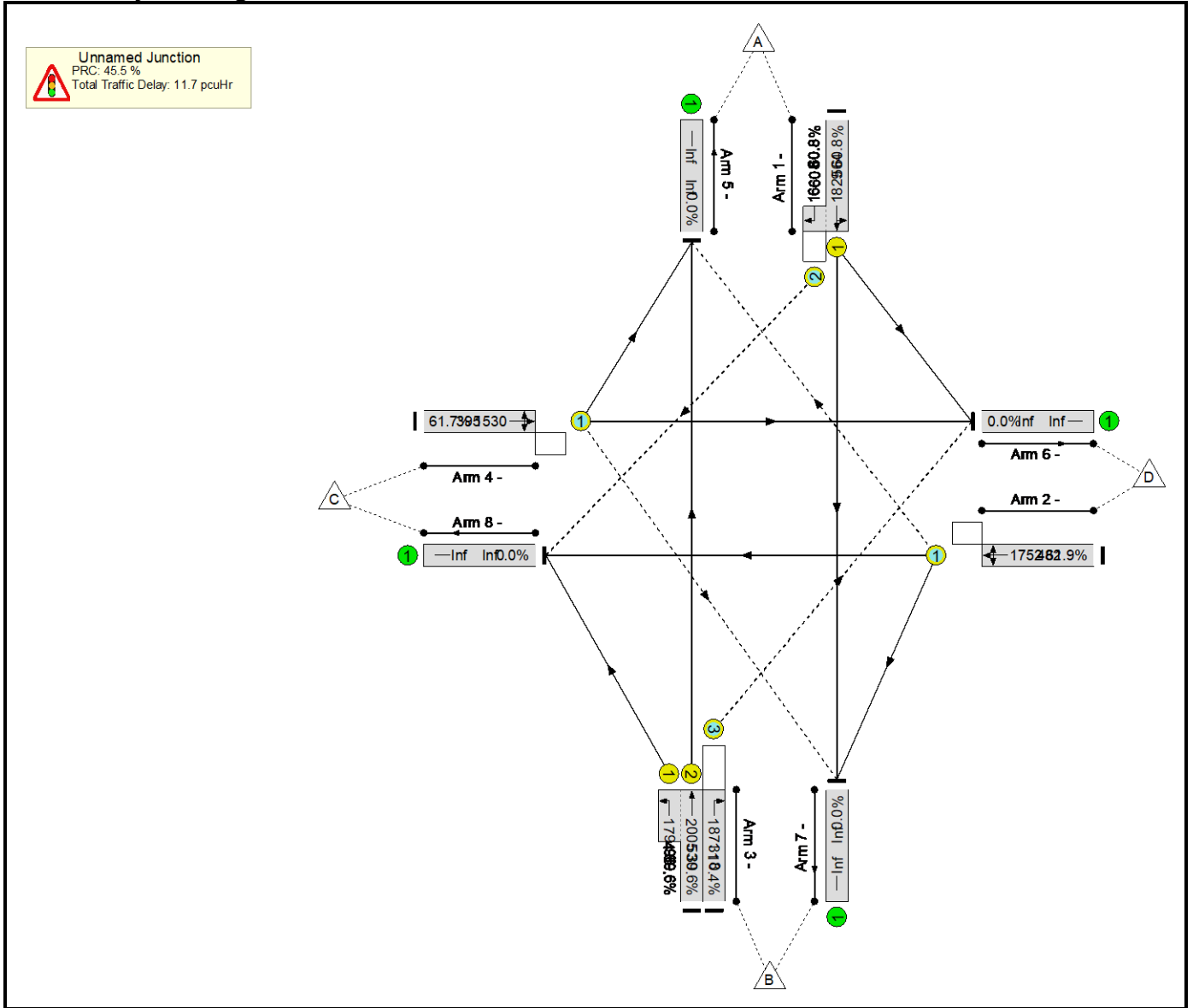
Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	111.0%	0	113	69	139.1	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	111.0%	0	113	69	139.1	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	29	-	534	1836:1660	474+10	110.3 : 110.3%	0	5	5	36.2	243.7	42.8
2/1	Right Left Ahead	O	D		1	31	-	519	1753	467	111.0%	0	10	1	40.1	277.8	50.4
3/2+3/1	Ahead Left	U	A		2	26	-	571	2005:1794	433+110	105.2 : 105.2%	-	-	-	26.3	165.9	32.3
3/3	Right	O	A		2	26	-	58	1871	180	32.2%	0	0	58	0.7	45.8	1.0
4/1	Left Ahead Right	O	C		1	37	-	535	1548	490	109.1%	0	98	5	35.8	241.1	46.6
C1				PRC for Signalled Lanes (%):		-23.4		Total Delay for Signalled Lanes (pcuHr):		139.08		Cycle Time (s):		120			
				PRC Over All Lanes (%):		-23.4		Total Delay Over All Lanes(pcuHr):		139.08							

Basic Results Summary

Scenario 6: '2026 + P2 + Dev SAT' (FG9: '2026 + P2 + Dev SAT', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network	-	-	-		-	-	-	-	-	-	61.9%	37	67	2	11.7	-	-
Unnamed Junction	-	-	-		-	-	-	-	-	-	61.9%	37	67	2	11.7	-	-
1/1+1/2	Left Ahead Right	U+O	B		2	35	-	348	1829:1660	564+8	60.8 : 60.8%	5	0	0	2.5	25.7	5.7
2/1	Right Left Ahead	O	D		1	32	-	298	1752	482	61.9%	0	33	1	3.9	47.7	9.4
3/2+3/1	Ahead Left	U	A		2	32	-	248	2005:1794	530+96	39.6 : 39.6%	-	-	-	1.5	21.8	3.3
3/3	Right	O	A		2	32	-	33	1871	318	10.4%	32	0	1	0.3	28.7	0.5
4/1	Left Ahead Right	O	C		1	30	-	244	1530	395	61.7%	0	33	1	3.5	51.0	7.9
C1					PRC for Signalled Lanes (%):		45.5	Total Delay for Signalled Lanes (pcuHr):		11.66		Cycle Time (s): 120					
					PRC Over All Lanes (%):		45.5	Total Delay Over All Lanes(pcuHr):		11.66							